

Sambeg Raj Subedi

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Prof. Jesse Rice-Evans

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Computer Mouse

In this era of science and technology, the computer has become a vital part of our life. It is used in almost every field. It does not just help in storing information and computing complex problems but, also helps increase productivity and efficiency in almost every field. Such an important device is composed of several parts such as software, monitor, CPU, keyboard, motherboard and so on. Apart from this, the computer also consists of a special input device called a mouse. The cursor on the computer screen moves with the movement created by the mouse. In order to run any program or operation, we need to give a command to the computer which in most of the cases is done by clicking the mouse button. It was invented by American scientist Douglas Engelbart in around 1960s. There are mainly two types of mouse, ball type mouse, and an optical mouse.



Fig : ball-type mouse



fig: Optical mouse

The mechanism for a mechanical mouse is quite different than of an optical mouse. In mechanical mouse, when we move the mouse across the desk, the ball under it gets rolled. The ball is attached with two types of wheels, x-axis wheel, and y-axis wheel. Y-axis wheel is responsible for detecting up and down movements while the x-axis is responsible for detecting side to side movements. Those two wheels are also made up of plastic spokes. Those spokes break the light beam when the wheel makes any turn or movement. On the other hand, more the wheel turns more the beams are broken. When we move the mouse then both x-y wheels get activated and plastic spokes present in each wheel cuts the light beam respectively. Counting and measuring the broken beams is done by the microchip located inside the mouse which helps to detect the direction and how far the wheel has turned. Those signals and information from microchip are then sent to the computer through USB cable making the cursor



responsive.

Fig : Inside ball-type mouse

An optical mouse is more advanced than that of mechanical mouse also called a ball-type mouse. It is composed of six vital components which are LED, plastic light guide, Light detector chip, scroll wheel, microswitch, and USB cable connection. Each of these components has its own function. The LED which is located at the bottom of the wheel generates a red light. The plastic light guide absorbs the reflected light and sends it towards the Light detector chip by making a certain angle. Light detector chip is a major component of the mouse because this part detects the reflected light and converts the analog movements of our hand into the digital signals. Those digital signals are then sent to the computer making the cursor responsive. The scroll wheel is located at the top of the mouse, it helps to scroll pages on the screen. In

order to detect the rotation of the scroll wheel, an optical encoder is attached to it which helps to convert analog movements of the wheel to the digital signals. There are two buttons on either side of the mouse which are called microswitch. These buttons work similarly as of the scroll wheel. The final component is the USB cable connection whose only function is to carry that digital information from mouse to the computer.

Among those types of mouse, ball types mouse has several limitations such as it does not work on all surfaces, a special mouse mat is needed which should be hard, flat and with the frictional surface. Whereas optical mouse works perfectly on any surface making it more convenient than a mechanical mouse. Another disadvantage of using this type of mouse is that rubber ball picks up the dirt gradually making the wheel difficult to move. It causes irresponsive cursor in the desktop and the only solution to fix this problem is cleaning the mouse in the regular interval. But in the case of an optical mouse, we don't have to face such problems as a result cursor accuracy of an optical mouse is much higher than of mechanical. An optical mouse is more reliable and long-lasting because not having any movable parts it has less chance of breaking. Thus, the optical mouse is more convenient, reliable and efficient, it is recommended for all computer users.